

Applicant : Vladimir Andreevich Bushuev
Serial No. : 09/649,431
Filed : August 25, 2000

restriction of the following inventions:

- I. Claims 1 and 2, drawn to a process of producing olefins, classified in class 585, subclass 648.
- II. Claims 3 and 4, drawn to a reactor, classified in class 422, subclass 189.
- III. Claim 5, drawn to a quenching apparatus, classified in class 422, subclass 207.

The Examiner stated that inventions are distinct, each from the other because of the following reasons:

The Examiner stated that inventions I and II are related as process and apparatus for its practice. The Examiner stated that the inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05 (e)). The Examiner stated that in this case the process as claimed can be practiced by another materially different apparatus, such as FCC (fluid catalytic cracking) unit.

The Examiner stated that inventions II and III are unrelated. The Examiner stated that the inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). The Examiner stated that in the instant case the different inventions have different modes of operation, different functions, or different effects. The Examiner stated that, for example, while the reactor

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is used to produced olefin, the quenching apparatus is used to cool hot materials.

The Examiner stated that, because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposed as indicated is proper.

The Examiner stated that a telephone call was made to Peter Phillips on June 20, 2001 to request an oral election to the above restriction requirement, but did not result in an election being made. The undersigned attorney has no record or recollection of such a call, but in any event would not have made an election without seeking instructions from applicant.

The Examiner stated that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

In response to the restriction requirement, applicant elects the invention of Group II, i.e. claims 3 and 4, but traverses the requirement with respect to the Examiner's statement that the process of invention I can be practiced by another materially different apparatus then that of invention II. Applicant accordingly requests reconsideration of the requirement with respect to inventions I and II.

In the Office Action the Examiner states that inventions I and II are related as process and apparatus for its practice, however, he considers the inventions under claims 1 and 3 as distinct, alleging that condition (1) is satisfied, i.e., that the process as claimed can be practiced by another materially different apparatus, such as

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FCC unit. Applicant will explain below that this requirement is not correct for this particular case.

Further, the Applicant submits the arguments in favor of the fact that MPEP 806.05(e) is not applicable here.

An apparatus wherein the process of claim 1 may be practiced with this technical result has not been known in the art. According to claim 1 the apparatus used must be a blading rotary reactor, i.e. pyrolysis heat is generated inside a volume of the mixture due to hydrodynamic drag of the rotor blades rotating therein and heating of the gaseous starting mixture to the pyrolysis temperature is performed therein by mixing with hot pyrolyzed gas being circulated in a working cavity of the blading rotary reactor. None of the prior known apparatuses, including also the FCC unit, can provide implementation of these requirements. In particular, in FCC units heating of the reacting gaseous mixture of pyrolysis temperature is performed on account of heat exchange with the granulated catalyst flow utilized as a heat carrier. Catalyst granules in the other part of the apparatus are heated to high temperature due to fuel burning. Hence, the principle of FCC unit operation does not permit to effect the method according to claim 1. In case the Examiner is aware of another design of the apparatus with the help of which, according to his view, the embodiment of process according to claim 1 is possible, he is requested to kindly inform the applicant about the specific source of information disclosing this design, or to provide a copy of such a document to applicant. It is necessary to add that FCC units are utilized basically for benzene preparation. Olefins in this process are obtained as a side product, and their yield amounts to not more than several percent of the starting material weight.

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Therefore the applicant is of the opinion that this explanation proves finally that condition (1) of the Examiner's Action can not be fulfilled, and consequently, that inventions I and II are not distinct. Therefore the applicant believes that inventions I and II should be examined in one application.

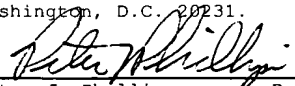
The preamble of claim 3 is being amended to recite that it relates to a method for producing low molecular olefins by pyrolysis of hydrocarbons (similarly to claim 1), and not to a method of pyrolysis in general.


Claim 1 is being amended to delete a feature which is not essential, but is rather an indication of technical result attained upon mixing as performed.

If a telephone interview would be of assistance in advancing the prosecution of the subject application, applicants' undersigned attorney invites the Examiner to telephone him at the number provided below.

Other than the one-month extension fee, no fee is deemed necessary in connection with the filing of this Amendment. If any additional fee is necessary, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 03-3125.

Respectfully submitted,

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| I hereby certify that this correspondence is being deposited this date with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner of Patents, Washington, D.C. 20231. | |
|  Peter J. Phillips Reg. No. 29,691 | 8-20-01 Date |


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Claims marked up to shown changes:

5 1. (Three Times Amended) A process for producing low-molecular
olefins by pyrolysis of hydrocarbons, which comprises preheating
and evaporating a starting feedstock mixing the same with a steam-
diluent, heating a resulting mixture to pyrolysis temperature in a
blading rotary reactor by heat generated inside a volume of the
10 mixture due to hydrodynamic drag of the rotor blades rotating
therein, quenching a cracked gas and subsequent separation of it
wherein the said heating the mixture to the pyrolysis temperature
is performed by mixing with hot pyrolyzed gas being circulated in
a working cavity of the blading rotary reactor [for a negligible
15 time in comparison with a duration of pyrolysis reactions].

 3. (Amended) A reactor for producing low-molecular olefins by
pyrolysis of hydrocarbons comprising a housing with directing
stationary blades, an inlet nipple for supplying feedstock, an
20 outlet nipple for carrying off cracked gas and a working wheel
provided with a blade crown, wherein the said housing has an
annular cavity for circulation of hot pyrolyzed gas, which contains
the directing stationary blades and surrounds the blade crown of
25 the working wheel along periphery, and the said inlet nipple for
supplying feedstock and outlet nipple for carrying off cracked gas
are communicated with the said cavity.